ROAD CURVATURE ESTIMATION AND AUTOMOTIVE TARGET STATE ESTIMATION SYSTEM

ABSTRACT OF THE DISCLOSURE

A first Kalman filter estimates true measures of yaw rate and vehicle speed from associated noisy measures thereof generated by respective sensors in a host vehicle, and a second Kalman filter estimates therefrom parameters of a clothoid model of road curvature. Measures of range, range rate, and azimuth angle from a target state estimation subsystem, e.g. a radar system, are processed by an extended Kalman filter to provide an unconstrained estimate of the state of a target vehicle. Associated road constrained target state estimates are generated for one or more roadway lanes, and are compared -- either individually or in combination -- with the unconstrained estimate. If a constrained target state estimate corresponds to the unconstrained estimate, then the state of the target vehicle is generated by fusing the unconstrained and constrained estimates; and otherwise is given by the unconstrained estimate alone.